

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
SCHMID et al.

)
) Applications

Serial No. Not Assigned

Filed:

For: PROCESS FOR THE PRODUCTION OF AQUEOUS POLYMER DISPERSIONS

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Prior to examination, kindly amend the above-identified application as follows.

IN THE CLAIMS

Please amend the claims as shown in the attached sheets.


REMARKS

The claims have been amended to eliminate multiple dependency. No new matter has been added. A clean copy of the claims is attached.

Entry of the above amendment is respectfully solicited.

Respectfully submitted,

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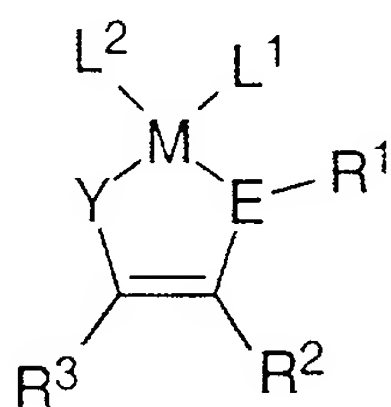
CLEAN VERSION OF AMENDED CLAIMS - OZ 53037

3. Process as claimed in claim 1, wherein an electrically neutral nickel complex compound is used as the complex compound of the general formula I a and/or I b.
4. Process as claimed in claim 2, wherein the activator a2) is an olefin complex of rhodium or nickel.
5. Process as claimed in claim 1, wherein ethylene is used exclusively as olefin.
6. Process as claimed in claim 1, wherein at least two olifins selected from the group comprising ethylene, propylene, 1-butene, 1-hexene and styrene are used.
8. Process as claimed in claim 1, where anionic, cationic and/or nonionic emulsifiers are employed as the dispersing agents b).
9. Process as claimed in claim 1, wherein aliphatic and aromatic hydrocarbons, fatty alcohols and/or fatty acid esters are used as the organic solvents c).
10. Process as claimed in claim 1, wherein the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which contains the metal complexes a1) in solution and which is present in the aqueous medium as a disperse phase having an average droplet diameter $\leq 1,000$ nm contains further components.
11. Aqueous polymer dispersion prepared by a process as claimed in claim 1

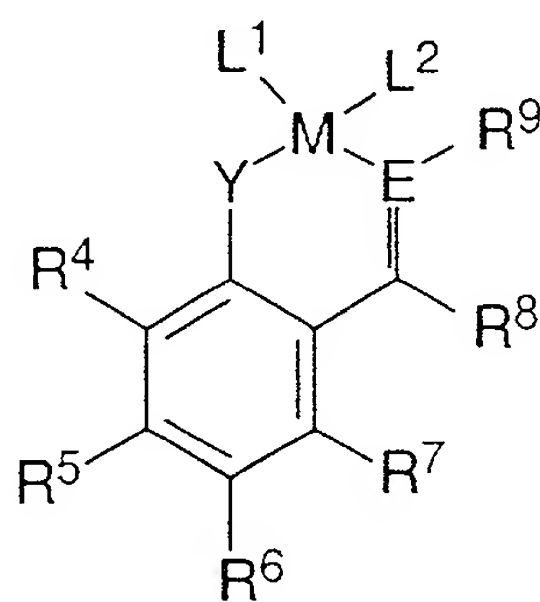
MARKED UP VERSION OF AMENDED CLAIMS - OZ 53037

3. Process as claimed in claim 1 [any of claims 1 or 2], wherein an electrically neutral nickel complex compound is used as the complex compound of the general formula I a and/or I b.
4. Process as claimed in claim 2 [any of claims 2 or 3], wherein the activator a2) is an olefin complex of rhodium or nickel.
5. Process as claimed in claim 1 [any of claims 1 to 4], wherein ethylene is used exclusively as olefin.
6. Process as claimed in claim 1 [any of claims 1 to 4], wherein at least two olifins selected from the group comprising ethylene, propylene, 1-butene, 1-hexene and styrene are used.
8. Process as claimed in claim 1 [any of claims 1 to 7], where anionic, cationic and/or nonionic emulsifiers are employed as the dispersing agents b).
9. Process as claimed in claim 1 [any of claims 1 to 8], wherein aliphatic and aromatic hydrocarbons, fatty alcohols and/or fatty acid esters are used as the organic solvents c).
10. Process as claimed in claim 1 [any of claims 1 to 9], wherein the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which contains the metal complexes a1) in solution and which is present in the aqueous medium as a disperse phase having an average droplet diameter $\leq 1,000$ nm contains further components.
11. Aqueous polymer dispersion prepared by a process as claimed in claim 1 [any of claims 1 to 10].

1. Process for the production of aqueous polymer dispersions by the reaction of one or more olefinically unsaturated compounds [olefins(s)] in aqueous medium in the presence of
 - a1) a complex compound of the general formula Ia and/or Ib



I a



I b

in which the substituents and indices have the following meaning:

- M a transition metal of groups 7 to 10 of the periodic system of the elements,
- L phosphanes $(R^{16})_xPH_{3-x}$ or amine $(R^{16})_xNH_{3-x}$ having identical or different substituents R^{16} , ethers $(R^{16})_2O$, H_2O , alcohols $(R^{16})OH$, pyridine, pyridine derivatives of the formula $C_5H_{5-x}(R^{16})_xN$, CO , C_1C_{12} alkyl nitriles, C_6C_{14} aryl nitriles or ethylenically unsaturated double-bonded systems, x standing for an integer between 0 and 3,
- L^2 halide ions, amide ions $(R^{16})_hNH_{2-h}$, h standing for an integer between 0 and 2,

and furthermore C₁-C₆-alkyl anions, allyl anions, benzyl anions or aryl anions,
wherein L¹ and L² can be linked to one another by means of one or more
covalent bonds,

E nitrogen,

Y oxygen, sulfur, N-R¹⁰ or P-R¹⁰,

R¹ hydrogen, C₁-C₁₂-alkyl groups, C₇-C₁₃ aralkyl substituents or C₆-C₁₄ aryl groups,

R², R³ independently of one another

hydrogen,

C₁-C₁₂ alkyl, wherein the alkyl groups can be branched or unbranched,

C₁-C₁₂ alkyl, singly or multiply substituted by identical or different C₁-C₁₂

alkyl groups, halogens, C₁-C₁₂ alkoxy groups or C₁-C₁₂ thioether groups,

C₇-C₁₃ aralkyl,

C₃-C₁₂ cycloalkyl,

C₃-C₁₂ cycloalkyl, singly or multiply substituted by identical or different C₁-C₁₂

alkyl groups, halogens, C₁-C₁₂ alkoxy groups or C₁-C₁₂ thioether groups,

C₆-C₁₄ aryl,

C₆-C₁₄ aryl, identically or differently substituted by one or more C₁-C₁₂ alkyl

groups, halogens, singly or multiply halogenated C₁-C₁₂ alkyl groups, C₁-

C₁₂ alkoxy groups, silyloxy groups OSiR¹¹R¹²R¹³, amino groups NR¹⁴R¹⁵ or

C₁-C₁₂ thioether groups,

C₁-C₁₂ alkoxy groups,

silyloxy groups OSiR¹¹R¹²R¹³,

halogens or

amino groups $\text{NR}^{14}\text{R}^{15}$

wherein the substituents R^2 and R^3 can form a saturated or unsaturated 5- to 8-membered ring with one another,

R^4 to R^7 independently of one another

hydrogen,

$\text{C}_1\text{-C}_{12}$ alkyl, wherein the alkyl groups can be branched or unbranched,

$\text{C}_1\text{-C}_{12}$ alkyl, singly or multiply substituted by identical or different $\text{C}_1\text{-C}_{12}$ alkyl groups, halogens, $\text{C}_1\text{-C}_{12}$ alkoxy groups or $\text{C}_1\text{-C}_{12}$ thioether groups,

$\text{C}_7\text{-C}_{13}$ aralkyl

$\text{C}_3\text{-C}_{12}$ cycloalkyl,

$\text{C}_3\text{-C}_{12}$ cycloalkyl, singly or multiply substituted by identical or different $\text{C}_1\text{-C}_{12}$ alkyl groups, halogens, $\text{C}_1\text{-C}_{12}$ alkoxy groups or $\text{C}_1\text{-C}_{12}$ thioether groups,

$\text{C}_6\text{-C}_{14}$ aryl,

$\text{C}_6\text{-C}_{14}$ aryl, identically or differently substituted by one or more $\text{C}_1\text{-C}_{12}$ alkyl groups, halogens, singly or multiply halogenated $\text{C}_1\text{-C}_{12}$ alkyl groups,

$\text{C}_1\text{-C}_{12}$ alkoxy groups, silyloxy groups $\text{OSiR}^{11}\text{R}^{12}\text{R}^{13}$, amino groups

$\text{NR}^{14}\text{R}^{15}$ or $\text{C}_1\text{-C}_{12}$ thioether groups,

$\text{C}_1\text{-C}_{12}$ alkoxy groups

silyloxy groups $\text{OSiR}^{11}\text{R}^{12}\text{R}^{13}$,

halogens

NO_2 groups or

amino groups $\text{NR}^{14}\text{R}^{15}$,

wherein pairs of neighboring substituents R^4 to R^7 can form a saturated or unsaturated 5- to 8-membered ring with one another,

R^8, R^9 independently of one another

hydrogen,

$\text{C}_1\text{-C}_6$ alkyl groups,

$\text{C}_7\text{-C}_{13}$ aralkyl substituents or

$\text{C}_6\text{-C}_{14}$ aryl groups, optionally substituted by one or more $\text{C}_1\text{-C}_{12}$ alkyl groups,

halogens, singly or multiply halogenated $\text{C}_1\text{-C}_{12}$ alkyl, $\text{C}_1\text{-C}_{12}$ alkoxy groups,

silyloxy groups $\text{OSiR}^{11}\text{R}^{12}\text{R}^{13}$, amino groups $\text{NR}^{14}\text{R}^{15}$ or $\text{C}_1\text{-C}_{12}$ thioether groups,

R^{10} to R^{15} independently of one another

hydrogen,

$\text{C}_1\text{-C}_{20}$ alkyl groups, which on their part may be substituted by $\text{O}(\text{C}_1\text{-C}_6$

alkyl) or $\text{N}(\text{C}_1\text{-C}_6 \text{ alkyl})_2$ groups,

$\text{C}_3\text{-C}_{12}$ cycloalkyl groups,

$\text{C}_7\text{-C}_{13}$ aralkyl substituents or $\text{C}_6\text{-C}_{14}$ aryl groups

R^{16} hydrogen,

$\text{C}_1\text{-C}_{20}$ alkyl groups, which for their part may be substituted by $\text{O}(\text{C}_1\text{-C}_6 \text{ alkyl})$ or

$\text{N}(\text{C}_1\text{-C}_6 \text{ alkyl})_2$ groups,

$\text{C}_3\text{-C}_{12}$ cycloalkyl groups,

$\text{C}_7\text{-C}_{13}$ aralkyl substituents or $\text{C}_6\text{-C}_{14}$ aryl groups,

b) dispersing agents and optionally

- c) organic solvents having low solubility in water,
 - d) the metal complexes a1) being dissolved in a portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water and
 - e) the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which holds the metal complexes a1) in solution being present in the aqueous medium as a dispersed phase having an average droplet diameter $\leq 1,000$ nm.
2. Process as claimed in claim 1, wherein the metal complex a1) is used in combination with an activator a2).
 3. Process as claimed in claim 1, wherein an electrically neutral nickel complex compound is used as the complex compound of the general formula I a and/or I b.
 4. Process as claimed in claim 2, wherein the activator a2) is an olefin complex of rhodium or nickel.
 5. Process as claimed in claim 1, wherein ethylene is used exclusively as olefin.
 6. Process as claimed in claim 1, wherein at least two olefins selected from the group comprising ethylene, propylene, 1-butene, 1-hexene and styrene are used.
 8. Process as claimed in claim 1, where anionic, cationic and/or nonionic emulsifiers are employed as the dispersing agents b).
 9. Process as claimed in claim 1, wherein aliphatic and aromatic hydrocarbons,

fatty alcohols and/or fatty acid esters are used as the organic solvents c).

10. Process as claimed in claim 1, wherein the portion or the total quantity of the olefinically unsaturated compounds and/or of the organic solvents c) having low solubility in water which contains the metal complexes a1) in solution and which is present in the aqueous medium as a disperse phase having an average droplet diameter $\leq 1,000$ nm contains further components.
11. Aqueous polymer dispersion prepared by a process as claimed in claim 1
12. Use of an aqueous copolymer dispersion as claimed in claim 11 as binding agent in adhesives, sealing compounds, plastic plasters and surface coatings.